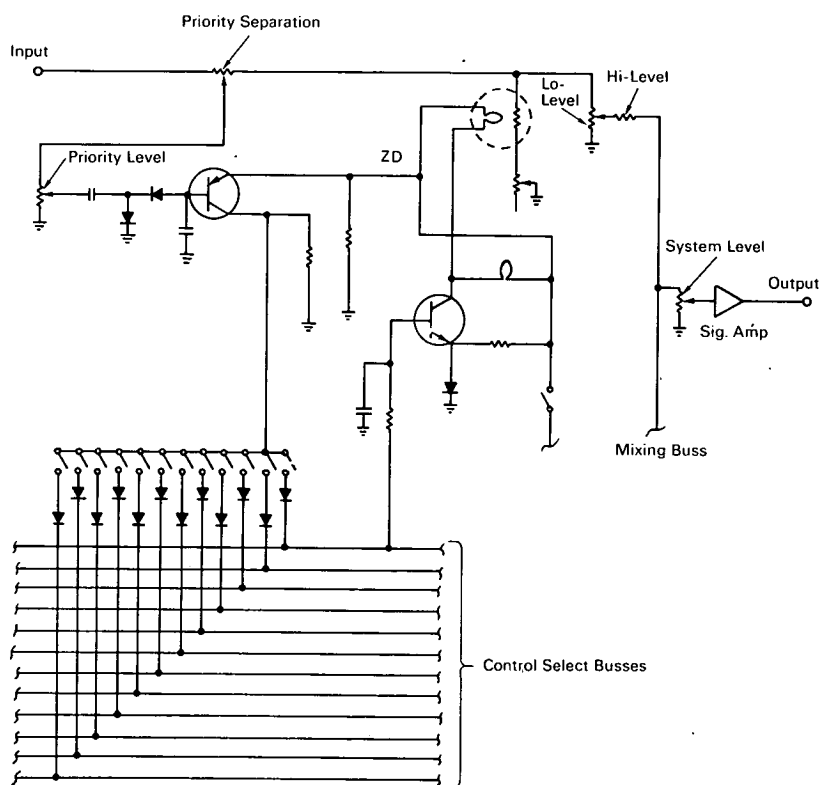


NASA TECH BRIEF



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Improved Communication System for Large Operations Center



A problem generally exists when using several microphones fed into a common system. Sound originating at any given signal source and picked up by multiple microphones, provides an effect similar to multiple sources picked up by a single microphone. This effect results in poor articulation (speech clarity) at the output (speaker) because of the varying phase shift at different frequencies and distances.

This problem is largely overcome by introduction into the system of an automatic microphone priority

control. Priority is established by an increase of sound level in any single microphone, which causes a simultaneous gain reduction in the amplifiers connected to the remaining microphones. This action suppresses echo and reverberation as a result of the recovery delay incorporated in the circuitry.

The figure illustrates one application of the technique. Priority control distributors (control select) provide negative bias voltage to the input stage of each priority control amplifier. When this voltage

(continued overleaf)

is increased, the gain of the input stage of the affected priority control amplifier is reduced. There are 12 priority control distributors in the system. Each distributor input is connected to the dc control output voltage of one of the priority control amplifiers. This output is routed through an isolation diode to 8 or 9 of the 12 priority control amplifier input stages.

The purpose of the signal distribution network is to mix and distribute the signal picked up by the microphones through the amplifiers and speakers at levels relative to the distance from each microphone to each of the speakers. Input to the signal distribution network is made from the output of the 12 priority control amplifiers, while output of the network is connected to the inputs of 16 speaker power amplifiers. The gain between any given microphone and each speaker is controlled by the signal distribution network and preset at slightly less than the acoustic attenuation between them.

Notes:

1. Hum-bucking coils are installed in all microphones to reduce magnetic field interference caused by current-carrying media in the environment.

2. The increased audio communication capability inherent in this system should give added effectiveness to centralized management functions in complex operations.

3. Documentation is available from:

Clearinghouse for Federal Scientific and
Technical Information

Springfield, Virginia 22151

Price \$3.00

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Patent status:

Inquiries about obtaining rights for the commercial use of this invention may be made to NASA, Code GP, Washington, D.C. 20546.

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